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May 1982
Development of EIFS II

SUPPLEMENT I TO THE ECONOMIC IMPACT FORECAST
SYSTEM (EIFS), VERSION 2.0: USER'S MANUAL—
COMMERCIAL ACTIVITIES (CA) PROGRAM

by
R. D. Webster
Susan Odom

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ments of DA Circular 235-1.* User instructions and definitions of CITA-EIFS equations are given.

*Just prior to publication, the acronym CITA was changed to Commercial Activities (CA). The acronym CA should be used for all references or inquiries about the requirements or actions described in this report as CITA. In addition, the system described in this report as CITA-EIFS will be referred to as EIFS/CA in all future publications and correspondence.

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FOREWORD

This research was conducted for the Directorate of Military Programs, Office of the Chief of Engineers (OCE), under Project 4A762720A896, "Environmental Quality Technology"; Task C, "Environmental Assessment"; Work Unit 004, "Development of EIFS II." The OCE Technical Monitor was Mr. Vince Gottschalk, DAEN-MPE.

The work was performed by the Environmental Division (EN) of the U.S. Army Construction Engineering Research Laboratory (CERL). Dr. R. K. Jain is Chief of CERL-EN.

COL Louis J. Circeo is Commander and Director of CERL, and Dr. L. R. Shaffer is Technical Director.

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SUPPLEMENT I TO THE ECONOMIC IMPACT FORECAST SYSTEM (EIFS) VERSION 2.0: USERS MANUAL— COMMERCIAL ACTIVITIES (CA)

1 INTRODUCTION

Background

The Environmental Technical Information System (ETIS) was developed by the U.S. Army Construction Engineering Research Laboratory (CERL) to help installation-level military personnel meet the planning and documentation requirements of the National Environmental Policy Act and related Department of the Army (DA) requirements.¹ One Component of ETIS is the Economic Impact Forecast System (EIFS). Since 1976, EIFS has been used by the Army, Air Force, and other Federal agencies to estimate, evaluate, and document the economic impacts of military realignments, construction projects, and other programs.

Recently, the military has been required to analyze and justify in-house vs contractor-operator functions at military facilities.² Specifically, the military must analyze the potential impacts various Commercial/Industrial Type Activities (CITA) will have on: *

1. The local economic region.
2. Individual employees.

These impacts must be assessed in addition to traditional cost-benefit considerations.

¹ R. D. Webster, R. L. Welsh, and R. K. Jain, *Development of the Environmental Technical Information System*, Interim Report E-52/ADA009668 (U.S. Army Construction Engineering Research Laboratory [CERL], April 1975); National Environmental Policy Act of 1969, 83 Stat 852, 42 USC 4321 et seq. (January 1970); and *Environmental Protection and Enhancement*, Army Regulation (AR) 200-1 (Department of the Army [DA], February 1974).

² *Industrialized Activities and Labor Relations Commercial/Industrial Activities (CITA)*, DA Circular 235-1 (DA, 1 February 1980). DA Circular 235-1 implements *Policies for Acquiring Commercial or Industrial Products and Services Needed by the Government*, OMB Circular A-76 (Office of Management and Budget [OMB], 29 March 1979).

*Just prior to printing, the acronym CITA was changed to Commercial Activities (CA). The acronym CA should be used for all references or inquiries about the requirements or actions described in this report as CITA. In addition, the system described in this report as CITA-EIFS will be referred to as EIFS/CA in all future publications and correspondence.

This document supplements the *Economic Impact Forecast System Revised Users Manual*, and describes how EIFS has been modified to help the military meet its responsibilities in analyzing CITA impacts, as prescribed by DA Circular 235-1.³

Objective

The objective of this work was to modify existing EIFS algorithms and software to accommodate specific CITA requirements.

Approach

1. CITA requirements were reviewed and analyzed.
2. Appropriate modifications were made to EIFS to accommodate CITA requirements.
3. The EIFS modifications were tested at various military installations.
4. Field test results were analyzed and additional EIFS modifications made.

Mode of Technology Transfer

The modification of EIFS to meet CITA requirements will be disseminated in accordance with procedures set forth in Army Regulation (AR) 18-1, *Management Information Systems Policies, Objectives, Procedures, and Responsibilities* (Department of the Army, March 1976).

2 USER INSTRUCTIONS

EIFS user instructions are documented in CERL Technical Report N-69.⁴ The CITA-specific profile is available from EIFS as a Functional Area under the predictive model profile (Profile 4). This chapter gives specific CITA-related user instructions.

The new CITA-EIFS profile is designed to complement the present EIFS and to comply with new military reporting standards. These new standards require the military to analyze the impact of any contracting

³ DA Circular 235-1; and J. W. Hamilton and R. D. Webster, *Economic Impact Forecast System Revised Users Manual*, Technical Report N-69/ADA073667 (CERL, July 1979).

⁴ J. W. Hamilton and R. D. Webster, *Economic Impact Forecast System Revised Users Manual*, Technical Report N-69/ADA073667 (CERL, July 1979).

action which would replace the work performed by 50 or more Department of Defense (DOD) employees. This analysis must include assessments of the impact on total business volume, employment income, population, and the tax base in the affected economic region.

How To Generate a CITA-EIFS Profile

To generate a CITA profile from EIFS, the user must input:

1. **Annual Expenditures for Local Services and Supplies.** This figure should include local-level operating costs for one fiscal year.

2. **Percent of Expenditure for Local Labor.** This figure is the percentage of the Annual Expenditures for Local Services and Supplies (Input 1, above) spent strictly on labor.

3. **Civilian Employment.** This figure is the number of civilian jobs added or eliminated because of the CITA action.

4. **Average Income of Civilians.** This figure is the average yearly salary of the civilian jobs added or eliminated because of the CITA action.

5. **Military Strength.** This figure is the number of military added or subtracted because of the CITA action.

6. **Average Income of Military Personnel.** This figure is the average yearly salary of the military affected by the CITA action.

7. **Percent Military Personnel Living on Base.** This figure is a percentage (from 0 to 100) of the CITA-affected military living on base.

After receiving and processing the seven values listed above, CITA-EIFS gives the user five percentage changes, a Direct Volume figure, and an Export Employment Multiplier:

1. **Direct Volume.** This dollar figure identifies the direct change expected to be felt in local business volume or economic activity as a result of the proposed CITA action. Business volume includes the change in selected services, retail sales, wholesale trade, and manufacturing output. This is the direct injection (or withdrawal) of funds resulting from a CITA action. For example, a reduction in local procurements represents a withdrawal of activity from the economy and thus is

a *direct* change attributable to the CITA action. The Direct Volume figure is the "first round" or "first order" effect of any CITA impact.

2. **Export Employment Multiplier.** This number represents the total effect of each dollar spent in the local economy after all secondary rounds have been felt. This multiplier is an internal EIFS calculation based on economic theory and regional employment distribution. A multiplier of 2.6 indicates that \$1 of injected economic activity creates a total local effect of \$2.60.

3. **Change in Business Volume.** This figure is the total change in business volume attributed to the CITA action (i.e., the Direct Volume times the Export Employment Multiplier).

4. **Change in Total Personal Income.** This figure is an estimate of the change in total personal income expected as a result of a change in the region's economic activity.

5. **Change in Total Employment.** This figure is the total change in *manyears* of employment, *not* the change in the number of *actual* employed personnel.

6. **Change in Local Property Values.** This figure is an estimate of the total change in local assessed value of real property which may result from a CITA action. Although not required by DA Circular 235-1, this figure may be needed for a complete economic assessment of the impact of any proposed CITA action.

7. **Impact on Tax Base/Change in Tax Revenues.** This figure is an estimate of the impact on the tax base in the local region as a result of changes in property value revenues or sales tax revenues.

After accessing and using the CITA-EIFS profile, the user may wish to compare the profile's "percentage changes" with the region's historic positive and negative deviations. To do so, the user simply accesses Profile 6, the Rational Threshold Value Profile (RTV). This profile will give the user all the historic data in the EIFS data base.⁵ These data are organized by business volume, personal income, employment, and population for the user's predefined region.

⁵R. D. Webster, et al., *The Rational Threshold Value (RTV) Technique for the Evaluation of Regional Economic Impacts*, Technical Report N-49/ADA055561 (CERL, June 1978).

Data entered into CITA-EIFS should be the *best available* estimates of changes in payroll, local purchases, effects on employees, contractor hiring plans, etc. The following items should be addressed in the community's economic impact estimate:

1. Total population change.
2. Change in business volume.
3. Change in total personal income.
4. Change in total employment.
5. Impact on the tax base.

Figure 1 is a sample CITA-EIFS profile.

CITA Equations for EIFS

- ΔCiv:** Number of civilian employees currently performing the function who will be released because of the CITA action.
- Civ SAL:** Average salaries of affected civilians.
- ΔMil:** Number of military employees currently performing the function who will be reassigned because of the CITA action.
- Mil SAL:** Average salary of affected military.
- % ob:** Percentage of affected military living on base.
- ΔS&S:** The dollar volume of services and supplies furnished from the return-on-investment in support of the CITA action being considered.
- Dol Vol:** Estimated cost of contracting the CITA action.

$$\Delta \text{Bus Vol} = [(\Delta \text{Civ}) (\text{Civ SAL}) + (\Delta \text{Mil}) (\text{Mil SAL}) (\% \text{ ob}) (0.75) + (\Delta \text{Mil}) (\text{Mil SAL}) (1 - \% \text{ ob}) + \Delta \text{S\&S} + \text{Dol Vol}] \text{ Multiplier}$$

$$\Delta \text{PI} = \text{same as current EIFS}$$

$$\Delta \text{Emp} = \text{same as current EIFS}$$

$$\Delta \text{Prop Val} = \text{same as current EIFS}$$

$$\Delta \text{Tax Rev} = \text{same as current EIFS}$$

$$\Delta \text{Pop} = \frac{(\text{Dol Vol})(\text{SAL Adj})}{\text{Civ SAL} (\Delta \text{Mil}) - (\Delta \text{Civ}) (2.5)}$$

$$\text{SAL Adj} = \frac{(\Delta \text{Mil}) (\text{Mil SAL}) + (\Delta \text{Civ}) (\text{Civ SAL})}{(\Delta \text{Mil}) (\text{Mil SAL}) + (\Delta \text{Civ}) (\text{Civ SAL}) + (\Delta \text{S\&S})}$$

Batch Use of the CITA Modification

Users who do not have the necessary hardware to use CITA-EIFS interactively can request CERL's help by filling in and mailing the Input Form in the appendix to:

Commander/Director
USA Construction Engineering Research Laboratory
ATTN: CERL-EN (EIFS/CA)
P. O. Box 4005
Champaign, IL 61820

3 CONCLUSION

This supplement to the *EIFS Revised Users Manual* described the modifications made to EIFS to allow military personnel to fulfill the CITA-reporting requirements of DA Circular 235-1. User instructions and definitions of CITA-EIFS equations are given.

1. **Region.** An installation or the multicounty area surrounding an installation which would be economically affected by the CITA action.

First County or Region: FORT HOOD

You have Selected:

County	State	Population	Area (Sq Mi)
Bell	TX	124,483	1,047
Burnet	TX	11,420	996
Coryell	TX	35,311	1,043
Lampasas	TX	9,323	726
McLennan	TX	147,553	1,000
Williamson	TX	37,553	1,104
TOTAL		365,395	5,916

2. **CITA Input Data.** The data entries for the example are entered as follows (user input is underlined):

CONTRACTOR/INDUSTRIAL TYPE ACTIVITIES (CITA)

Project name: fort hood: CITA (Motor Vehicle Maintenance)

(Enter decreases as negative numbers)

Change in civilian employment: -75

Average income of affected civilians: 20248

Change in military employment: -5

Average income of affected military: 10443

Percent military personnel living on-base (0 to 100): 60

Change in local expenditures for services and supplies: -64288

Estimated contract value: 580166

After the data entries are supplied to the computer, output is obtained almost immediately. This information can be used directly to satisfy the requirements of DA Circular 235-1. If necessary, an explanation of the terms can be added.

Economic Impact Forecast for fort hood: CITA (Motor Vehicle Maintenance)

Direct volume:	\$	-1,047,000. 00	
Export employment multiplier:		2. 1547	
Change in total business volume:	\$	-2,256,000. 00	(-0. 133%)
Induced business volume:	\$	-1,209,000. 00	
Change in personal income:	\$	-2,160,000. 00	(-0. 136%)
Change in employment:		-231	(-0. 130%)
Impact on tax base:			
Change in local property values:	\$	-2,646,000. 00	(-0. 133%)
Change in tax revenues:	\$	-270,000. 00	
Change in population:		-131	

Figure 1. Sample CITA-EIFS profile.

**APPENDIX:
EIFS/CA PROFILE REQUEST FORM**

SUBJECT: Request for EIFS/CA Economic Impact Assessment

Commander/Director
USA Construction Engineering Research Laboratory
ATTN: CERL-EN (EIFS/CA)
P. O. Box 4005
Champaign, IL 61820

1. Ref: Para 3-17f(3) (d), DA Circular 235-1, *Commercial/Industrial-Type Activities (CITA)*, 1 Feb 80.

2. Requestor Name and Mailing Address: _____

Telephone Number: _____

3. CA Input Data (Enter Decreases as Negative Numbers):*

Region (Military Installation or Regional Counties): _____

PROJECT NAME: _____

CIVILIAN EMPLOYEES TO BE RELEASED: _____

AVERAGE INCOME OF AFFECTED CIVILIAN EMPLOYEES: _____

MILITARY PERSONNEL TO BE REASSIGNED: _____

AVERAGE INCOME OF AFFECTED MILITARY PERSONNEL: _____

PERCENT MILITARY PERSONNEL LIVING ON POST (0 TO 100): _____

CHANGE IN LOCAL EXPENDITURES FOR SERVICES AND SUPPLIES: _____

ESTIMATED COST OF CONTRACTING THE FUNCTION: _____

*Questions: Contact Environmental Division, CERL. Telephone commercial 217-352-6511 or FTS 958-7230.

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National Defense Headquarters
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Office of the Sec of Def
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WASH DC 20301

ARO-London
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FPO NY 09510

US Army, CE
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Fort Campbell, KY 42223
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Fort Hood, TX 76544
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